

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) An information recording/reproducing method comprising the steps of:

partially heating a recording medium with an approximately circular optical spot in thermo-magnetic recording to form a magnetic domain whose magnetic wall is along a curve of the thermal distribution of the partially heated region in a magnetic recording layer of the recording medium, while applying a magnetic field to the vicinity of the partially heated region, and

scanning the recording medium so that magnetic flux from the magnetic domain is detected to reproduce by a magnetic flux detecting means, wherein an orientation of the magnetic domain is aligned with respect to the longitudinal direction of the magnetic flux detecting means in accordance with the position of recording,

wherein an approximately crescent shape recording magnetic domain is formed by the thermo-magnetic recording in which a direction of a magnetic wall aligns with a direction of thermal distribution, and

forming the approximately circular optical spot with an optical head as an optical recording element on a first swing arm, and detecting magnetic flux with a magnetic flux detection element on a second swing arm,

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wherein the distance between a rotation center of the recording medium and the first swing arm axis for the optical head and a distance between a rotation center of the recording medium and the second swing arm axis for the magnetic flux detection element are the same.

2. (Currently Amended) An information recording/reproducing apparatus for storing information with a magnetic domain in a magnetic recording layer formed on a substrate of a recording medium, comprising,

a thermo-magnetic recording system having an approximately circular optical spot recording head heating means for heating partially the magnetic recording layer and, magnetic field applying means for applying a magnetic field to the vicinity of an area heated by the heating means, and

magnetic flux detecting means for detecting a magnetic flux with scanning on the recording medium,

wherein an approximately crescent shape recording the magnetic domain is formed by the thermo-magnetic recording system in which a direction of a magnetic wall aligns with a direction of thermal distribution so that the magnetic domain wall is along a curve of the thermal distribution of the region heated by the recording head heating means, and a difference between a radial position of the recording head heating means when heating partially the recording medium to form the magnetic domain and a radial position of the magnetic flux detecting means when detecting the magnetic flux generated by the magnetic domain is changed so that a magnetic wall orientation of the magnetic domain is formed along a longitudinal

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direction of the magnetic flux detecting means at each recording track to be scanned during recording/reproducing, further including,

a first swing arm for the recording head and a second swing arm for the magnetic flux detecting element, wherein the distance between a rotation center of the recording medium and an axis of the first swing arm and a distance between the rotation center of the recording medium and an axis of the second swing arm are the same.

3. (Currently Amended) An information recording/reproducing apparatus for storing information with a magnetic domain in a magnetic recording layer formed on a substrate of a recording medium, comprising,

a thermo-magnetic recording system having an approximately circular optical spot recording head heating means for heating partially the magnetic recording layer, magnetic field applying means for applying a magnetic field to the vicinity of an area heated by the recording head heating means, and a swing-arm-shaped supporting portion on which magnetic flux detecting means for detecting a magnetic flux on the recording medium is mounted,

wherein an approximately crescent shape recording the magnetic domain is formed so that the magnetic domain wall is along a curve of the thermal distribution an isotherm of the region heated by the recording head heating means, and an orientation of a thermal distribution generated by the partial heating for forming the magnetic domain is rotated in accordance with a radial position of the heating means when heating partially the recording medium to form the magnetic domain so that a magnetic wall orientation of the magnetic domain is formed along a

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longitudinal direction of the magnetic flux detecting means at each recording track to be scanned during recording/reproducing, further including,

a first swing arm for the recording head and a second swing arm for the magnetic flux detecting element, wherein the distance between a rotation center of the recording medium and an axis of the first swing arm and a distance between the rotation center of the recoding medium and an axis of the second swing arm are the same.

4. (Currently Amended) An information recording/reproducing apparatus according to claim 3, characterized in that wherein a longitudinal direction of the region heated area-by the recording headheating means- is substantially parallel to a longitudinal direction of the magnetic flux detecting means.

5. (Currently Amended) An information recording/reproducing apparatus according to claim 3, wherein characterized in that the recording head heating means-is a light emitting means for forming a minute light spot, at least a part of the light emitting means is formed on the first swing arm, and

an optical element is arranged on an optical path of the light emitting means to project the minute light spot on the recording medium and elongate the light spot in a swing-arm-moving direction of the first swing arm.

6. (Currently Amended) An information recording/reproducing apparatus according to claim 3, wherein characterized in that a tracking position of the recording

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head heating means is changed relatively with respect to a tracking position of the magnetic flux detecting means, in accordance with a radial position of a track scanned on the disk.

7. (Currently Amended) An information recording/reproducing apparatus according to claim 2, wherein characterized in that an optimum relative tracking position is obtained through a test writing and a test reading when the tracking position of the recording head heating means is relatively changed with respect to the tracking position of the magnetic flux detecting means in accordance with a radial position of the track scanned on the disk.

8. (Currently Amended) An information recording/reproducing apparatus and information recording medium according to claim 2, wherein characterized in that the recording medium has an information recording layer on a substrate surface including recess-and-projection structure on the surface, and the magnetic flux detecting means scans approximately a center of a circumferential projection area of the recording medium.

9. (Currently Amended) An information recording/reproducing apparatus according to claim 8, using wherein the recording medium according to claim 8, characterized in that has a recess-and-projection structure such that an angle of the recess-and-projection structure with respect to the track direction is substantially in accord with an angle of the magnetic flux detecting means with respect to the track direction, at each position on the recording medium.

Claims 10-11 (Cancelled)

12. (Previously Presented) An information recording/reproducing method according to claim 1, wherein the thermal distribution direction is a longitudinal direction of the thermal distribution determined by heating partially the recording medium.

13. (Currently Amended) An information recording/reproducing apparatus according to claim 3_2, wherein the orientation of the thermal distribution is a longitudinal direction of the thermal distribution determined by heating partially the recording medium.